

OVERVIEW OF THE TEXAS IMPORTED FIRE ANT RESEARCH AND MANAGEMENT PROJECT

Bastiaan M. Drees and Ray Frisbie
Department of Entomology, The Texas A&M University System
College Station, Texas 77843-2475

ABSTRACT

The Texas Imported Research and Management Project was initiated in 1997 after the Texas legislature provided funding for the plan developed in response to Texas House Bill 2341 authored by Representative Tom Ramsay in 1995. The project funds 35 research, regulatory and education projects annually at all of the major Texas institutions involved in addressing red imported fire ant. Three committees providing oversight for the project are described. In addition, production of educational support materials and a web site for information delivery, outreach Extension education focusing on community-wide fire ant integrated pest management, and special projects undertaken with funding from the Texas Department of Transportation and the Texas Army National Guard are reviewed. Involvement of people in this cooperative and collaborative effort and other indicators of the project's success are discussed.

INTRODUCTION

Historical background. In 1995, Representative Tom Ramsay authored Texas House Bill 2341, which mandated that The Texas A&M University System's Texas Agricultural Experiment Station take the lead in developing a red imported fire ant, *Solenopsis invicta* Buren (Hymenoptera: Formicidae), plan for Texas. The "Texas imported fire ant research and management plan" was developed by S. B. Vinson and the authors and in coordination with research personnel at the Texas Agricultural Experiment Station, Texas Tech University, the University of Texas at Austin, and the Texas Department of Agriculture. The plan was funded by the Texas legislature in June 1997 at an annual funding level of \$2.5 million. Funding has supported about 35 projects for the first two bienniums (fiscal years 1998-1999, 2000-2001) addressing research, regulatory and educational programs at collaborating institutions. The project overview provides background information and introduces the 15 symposium presentations that detail scientific advances gained through the project's funding.

Committee structure. Texas House Bill 2341 established a 12- member oversight committee called Fire Ant Research Ant Management Account Advisory Committee (FARMAAC). Three of the committee's members are appointed by the Governor of Texas every biennium, representing agricultural, public utilities, and citizen interests. Remaining members include administrative personnel from collaborating institutions (listed above), Texas Parks and Wildlife, United States Department of Agriculture (USDA), and the Structural Pest Control Board. This committee approves all projects funded.

A second 12-member committee overseeing implementation of the plan is the Texas Fire Ant Research and Management Initiative Committee (FARMIC). This committee is

composed of scientists from collaborating institutions and agencies that meet regularly to evaluate progress of funded projects and to make recommendations to FARMAAC for project coordination and cooperation. Both committees meet twice per year. Finally, the project has established a Peer Review Committee comprised of discipline-based scientists from outside the state. This committee met in 1998 and 1999 to review progress of all funded projects and assure that projects were 1) addressing the goals of the Texas Fire Ant Project; 2) scientifically based and technically acceptable. Currently, the chair of the Peer Review Committee is Dr. David Williams, USDA - Agriculture Research Service. Reviews to date have been very positive. This committee will meet again in 2001. The Texas Fire Ant Project is currently evaluating pre-proposals submitted for funding through the third biennium (fiscal years 2002-2003), the last biennium of the six-year plan. Five major areas of research focus have been identified: 1) biological control; 2) physiological processes and behaviorally-modifying chemicals; 3) genetics and genomics; 4) regulatory issues; and 5) integrated pest management.

ACCOMPLISHMENTS

Educational Support Materials. Research results generated through the project's funding are being delivered to the citizens of Texas through the Texas Agricultural Extension Service (TAEX). Efforts by specialists, faculty, and staff at collaborating institutions have resulted in the generation of numerous publications, over 35 fact sheets (in English and some in Spanish), a newsletter ("Fire Ant Trails"), images, research summaries and reports, and result demonstration reports of product evaluations. TAEX publications and fact sheets were compiled and produced in a booklet of reprints with was sent of each of the 789 Texas public libraries in September 2000 as part of the educational outreach effort associated with "Fire Ant Awareness Week" first established by Governor George W. Bush in 1998. Another focus of Fire Ant Awareness Week 2000 was day-care centers and nursing homes, which received news releases and fact sheets highlighting the threat from imported fire ants and management approaches to minimize risk of stinging incidents at these centers.

All of the information and educational resource materials generated by the Texas Fire Ant Project has been posted on the web site, <http://fireant.tamu.edu>, which was first posted in 1997. Since then the number of visitors to the site has grown rapidly. In 1999, the site received 1.1 million "hits." This number increased to 2.1 million in 2000, representing 140,000 user sessions (5,651 "hits" or 386 sessions per day).

Community-Wide Fire Ant Management Programs. Funding provided for implementation of the Texas Fire Ant Research and Management Plan allowed TAEX to hire four Extension Agents - IPM: Nathan Riggs in Bexar County, Lisa Lennon in Travis and Williamson Counties; Dr. Paul Nester in Harris County and Elizabeth Hickman in Dallas and Fort Worth Counties. These agents focus on reaching community groups such as homeowner associations or any group wanting to work together with their neighbors to manage ants in areas larger than single properties. These agents receive technical support and supervision from Dr. Charles Barr, Extension Program Specialist with assistance from Rody Best, Extension Assistant, who also provide support for other county agent fire ant management educational program efforts throughout the state. Results of on-going, community-wide fire ant management "pilot showcase" programs will be presented as part of this symposium by Nathan Riggs. Data document that this approach dramatically reduces imported fire ant mound numbers, cost and amount of pesticides used to achieve control.

Although a number of approaches for managing imported fire ants are recognized and described (Drees et. al, 1999 & 2000), including the "ant elimination method" (for pest control operators), individual mound treatments, as well as some "organic" and biological control

methods, the Extension Service promotes the “Two-Step Method” of fire ant control in heavily infested areas (areas with 20 or more imported fire ant mounds per acre or 5 per 0.1 h or 0.25 acre lawn. This approach is viewed as the most appropriate for managing fire ants in larger areas, such as neighborhoods and communities because of its ease of application, cost-effectiveness and reduced insecticide requirements. The first step is the periodic (one or twice per year) broadcast application of one of the bait-formulated fire ant control products. The success of bait technology (Barr 2000) relies on the foraging behavior of imported fire ants, which depends on a combination of proper environmental conditions and use of fresh product, to provide 80 to 90 percent control for a period of weeks or months following treatment, depending on product selected. Initial control is relatively slow to occur. The second step uses an individual mound treatment to eliminate only unwanted or nuisance mounds that occur between broadcast treatments. Thus, this approach dramatically reduces the number of individual mound treatments required for control. Over-use of ant mound treatment products such as those containing diazinon has been cited at the cause of surface run-off water contamination in a number of Texas communities. However, one concern over widespread use of broadcast bait applications is the potential negative effect on native ant species which compete with imported fire ants for food and nesting sites, thereby providing biological resistance to imported fire ant re-invasion. This, however, does not seem to be the case as documented by monitoring efforts in the “pilot showcase” community-wide fire ant management programs to date.

New bait products introduced to the marketplace since the inception of the Texas Fire Ant Project have provided products to suppress ants in many new sites. Extinguish® Ant Bait (Wellmark International, Schaumburg, IL), containing s-methoprene, is now available for use in “cropland” and pastures. This project has allowed research to be directed at assessing the impact and cost-effectiveness of imported fire ant control in virtually all major agricultural commodities, a program being coordinated by Dr. Allen Knutson, TAEX.

Other highlights and special projects. The 15 oral paper presentations presented at this combined meeting of the Southwestern Branch of the Entomological Society of America, The Southwestern Entomological Society, and the Annual Imported Fire Ant Research Conference present the highlights of the project during its first four years (1998-2001). In addition to these papers, three additional papers and nine poster presentations, reporting results of projects funded by the Texas Fire Ant Project occurred during this event. However, additional funded projects were not included herein. Descriptions and progress reports of all funded projects are currently posted on the project’s web site. The projects discussed below constitute some of these projects that involve cooperation and collaboration between groups and other institutions.

The Texas Department of Transportation provided funding to the Texas Fire Ant Project to develop a prototype bait applicator device capable of treating right-of-way and rest stop areas. Dr. Charles Coble, Agricultural Engineer at Texas A&M University has developed a truck-mounted “bait blower” (FIG. 1) that uses a two-cycle gasoline engine to power a industrial-size blower. Bait is metered into the air blast using an auger calibrated to apply the material at the proper rate and can be adjusted for driving at different speeds. It has been demonstrated to apply 0.45 to 0.675 kg (1 to 1.5 lbs) of a bait-formulated fire ant control product while driving at 40 km (30 mi) per hour. Swath width varies with wind direction, but ranges from 900 to 1500 cm (30 to 50 ft). At a speed on 16 km (10 mi) per hour, the device can apply bait at a rate of 0.4 h (1 acre) per minute, as demonstrated in fall of 2000 when 20 h (50 acres) of Magnolia Gardens Nursery in Montgomery County, Texas, was treated within two hours. This device could be useful for applying bait products in community-wide imported fire ant management programs, abatement districts, attempted spot eradication programs.

The Texas Army National Guard has provided funding to the Texas Fire Ant Project

annually since 1998, supporting a number of projects such as the release of phorid flies and the evaluation of bait applications to determine the impact on red harvester ants which serve as a primary source of food for the Texas horned lizard, *Phrynosoma cornutum*. These projects were initiated by Dr. Jerry Cook, currently with Sam Houston State University. In addition, Rody Best and Dr. Mike Merchant with TAEX have been documenting results of managing imported fire ants in firing ranges containing fox holes and pop-up targets where the ants frequently sting recruits and disable the targets' electrically driven mechanisms.

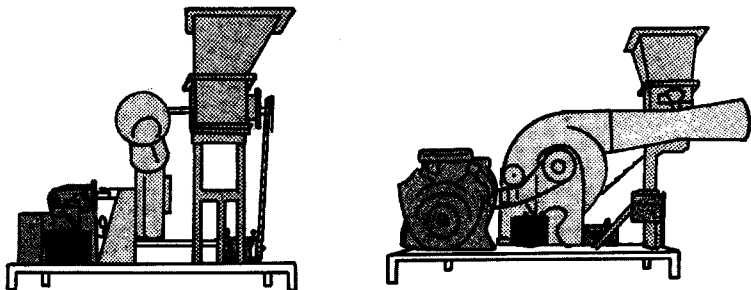


FIG. 1. Prototype truck-mounted "bait blower" developed by Dr. Charlie Coble with funding from the Texas Department of Transportation.

Finally, the Fire Ant and Weather Reporting Program was initiated in January 2000 by TAEX faculty and staff in Bexar (San Antonio), Brazos (Bryan/College Station), Harris and Williamson. This program uses standardized methodology to monitor red imported fire ant colonies in permanent, untreated plots. Ant mound numbers per 0.1 h (0.25 acre) plot, mound condition, and weather are reported monthly. Additional sets of ant mounds are examined for presence of brood, brood type and presence of winged reproductives (alates). Data generated from monitoring have been compiled by Rody Best, and posted on the project's web site, and currently document the impact of hot, dry summer conditions of fire ant populations in difference parts of the state (FIG. 2). These data might shed light on occasional localized control failures using broadcast bait treatments during periods when ant colonies are producing no brood and worker ants may not be foraging heavily.

Resource personnel and networking. The Texas Fire Ant Project has involved hundreds of people at collaborating and cooperating universities and agencies, including: 46 principal and co-principal investigators; 47 undergraduate and graduate students; 29 research associates; 34 others including Extension faculty and staff. Training professionals of tomorrow using the opportunity provided by this directed research program has been an investment that should continue to provide benefits to improving imported fire ant management approaches. Interstate cooperation and collaborating as exemplified by recent multi-state publications (Drees et. al 1999 & 2000) document that this project has been successful not only in Texas, but throughout the infested southern United States. These efforts have resulted in scientific breakthroughs and milestones, deliverable technical advances and scientific publications and presentations, all leading to the development and delivery of research-based educational information and improved imported fire ant management suggestions. These are all measures of success that

can be applied to the Texas Imported Fire Ant Research and Management Project.

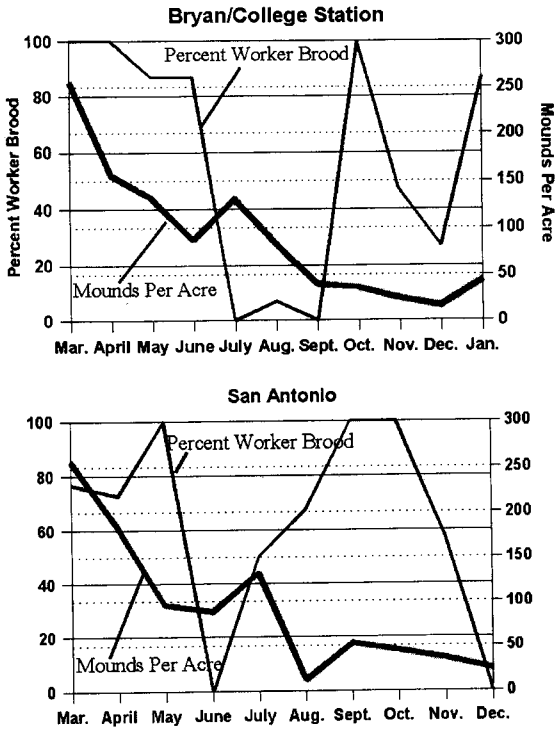


FIG 2. Fire Ant and Weather Reporting Program results, in part, 2000 (R. Best).

LITERATURE CITED

Barr, C. L. 2000. Broadcast Baits for Fire Ant Control. B-6099. Texas Imported Fire Ant Research & Management Plan. Texas A&M University, College Station, Texas. 12 pp.

Drees, B. M., C. L. Barr, D. R. Shanklin, D. K. Pollet, K. Flanders, B. Sparks, and K. Vail. 1999. Managing Red Imported Fire Ants in Agriculture. B-6076. Texas Imported Fire Ant Research & Management Plan. Texas A&M University, College Station, Texas. 20 pp.

Drees, B. M., C. L. Barr, S. B. Vinson, R. E. Gold, M. E. Merchant, N. Riggs, L. Lennon, S. Russell and P. Nester, D. Kostroun, B. Sparks, D. Pollet, D. Shanklin, K. Vail, K. Flanders, P. M. Horton, D. Oi, P.I Koehler, and J. T. Vogt. 2000. Managing imported fire ants in urban areas. B-6043. Texas A&M University, College Station, Texas, 20 pp.